

REMARKS

This Reply is submitted in response to the Office Action mailed November 27, 2007. Claims 1-37 remain pending in the application and stand rejected. Reconsideration of the rejections is respectfully requested in view of the remarks below.

Claims Rejected Under 35 U.S.C. §112

Claims 1-16 stand rejected under 35 U.S.C. §112, first paragraph. The Examiner alleges that "the pressure in the dispensing path is always greater than the pressure in the recirculation path", and that "there is no disclosure . . . of how the pressure of the liquid in the recirculation path could be greater than the pressure of the liquid in the dispensing path." (Office Action dated November 29, 2007, at p. 2.) The first statement is incorrect. As discussed in the Amendment filed June 25, 2007, the specification was previously amended to correct a typographical error and to explain that the fluid pressure in supply chamber 44 is maintained less than the sum of the fluid pressure in the recirculation passageway 34 and the cracking pressure of the check valve during the characteristic closing time required for the dispensing module 14 to cycle from the open condition to the closed condition. Accordingly, the pressure in the dispensing path is not always greater than the pressure in the recirculation path, as alleged by the Examiner.

The Examiner's second statement is also incorrect. In the Amendment filed June 25, 2007, Applicants explained that a pump is generally used to pump liquid from the melter 22 to supply channels 20. Support for such an arrangement can be found with

reference to the Application at page 14, line 23 to page 15, line 10, and at page 16, lines 1-6. As noted in the Declaration of Michael W. Harris, filed October 16, 2007, the Application incorporates by reference U.S. Patent No. 6,089,413. (Application at p. 11, lines 1-4.) Column 6, lines 23-27, of the '413 patent discusses a separate pump between the melter and individual manifold segments, with reference to FIG. 2 of the '413 patent. The purpose of the pump between the melter and the manifold segments is to overfeed adhesive to the gear pumps of the manifold segments so that a starved condition of the gear pumps is avoided. (Harris Declaration at p. 3, lines 3-10.) Overfeeding the gear pumps results in the fluid pressure at the inlet side of the gear pumps (e.g., the recirculation path) being greater than the fluid pressure at the outlet side of the gear pumps (e.g., the dispensing path). Accordingly, the specification discloses, and persons skilled in the art would understand, how the pressure of fluid in the recirculation path could be greater than the pressure of fluid in the dispensing path.

The Examiner also states that "the check valve 80 would not operate as described and would close the recirculation path if the pressure in the recirculation path were greater than the pressure in the dispensing path." (November 29 Office Action at p. 2.) Applicants assert that the Application correctly describes operation of the check valve. The Application specifically states that "[a] problem encountered in liquid applicators incorporating three-way dispensing modules is that, during intermittent dispensing, liquid flows unintentionally through the recirculation passageway as the valve element shifts from the open condition toward the closed condition." (Application at p. 3, lines 13-16.) In one aspect, the invention addresses this problem by including a

check valve (reference numeral 80 in FIGS. 2-3) in the recirculation passageway 34 of the recirculation path to prevent backflow from the recirculation path to the dispensing module when the pressure in the recirculation path is greater than the pressure in the dispensing path. (Application at p. 5, lines 12-20; p. 16, lines 7-25.) The Application therefore correctly describes operation of check valve 80.

At page 4 of the November 29 Office Action, the Examiner concludes that the Declaration of Michael W. Harris is insufficient to overcome the rejections of claims 1-16 under 35 U.S.C. §112 because:

[w]hen the valve element 54 contacts the valve seat 48, the pressure in the recirculation outlet 58 is the same as the pressure in the supply chamber 44, if the pressure in the recirculation outlet 58 were less than the pressure at the recirculation path 34 the check valve would not open.

The condition described by the Examiner occurs at the instant that the dispensing valve has closed by contact of valve element 54 with valve seat 48 (see FIG. 3 of the Application). This is not the condition recited in the rejected claims. Claims 1 and 11 are the only independent claims of this rejected group, and each recites:

preventing backflow of liquid from the recirculation path to the dispensing module when the dispensing valve is cycling from the open condition to the closed condition and the pressure of the liquid in the recirculation path is greater than the pressure of the liquid in the dispensing path. (Emphasis added.)

Referring to the embodiment depicted in FIGS. 2-3 of the Application, the conditions recited in claims 1 and 11 occur when valve element 56 is moving away from being seated against valve seat 52 (the open condition depicted in FIG. 2) toward the closed

condition depicted in FIG. 3, not when the dispensing valve has closed. Claims 1 and 11 further state that the pressure in the recirculation path (including recirculation chamber 46 and recirculation passageway 34) is greater than the pressure in the dispensing path (passageway 32, inlet 49, supply chamber 44, and discharge passageway 50). Under these conditions, check valve 80 remains closed and prevents backflow of liquid from recirculation passageway 34 into recirculation outlet 58, recirculation chamber 46, and supply chamber 44. (See Application at p. 16, lines 18-25.) The premise on which the Examiner has based his conclusions regarding the sufficiency of the Harris Declaration is therefore incorrect and the Examiner has failed to give proper weight to this declaration in rejecting claims 1-16.

For the reasons discussed above, the Examiner's allegations regarding the disclosed operation of the adhesive applicator are incorrect and Applicants respectfully request that the rejections of claims 1-16 under 35 U.S.C. §112 be withdrawn.

Claims Rejected Under 35 U.S.C. §103

Claims 17-20, 22, 23, 25, 26, 28-32, and 37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Riney '413 in view of U.S. Patent No. 4,200,207 to Akers et al. Claims 17, 18, 19, 22, 25, 28, 29, 31, and 37 are the only independent claims of this rejected group. Claims 18, 19, and 22 are directed to apparatus for applying liquid to a substrate and recite dispensing modules including recirculation outlets coupled in fluid communication with a recirculation passageway. Claims 18, 19, and 22 further recite check valves arranged to prevent backflow of liquid from the

recirculation passageway through the recirculation outlet to a dispensing module.

Claims 18, 19, and 22 are not taught or suggested by the combination of Riney '413 and Akers '207. Specifically, the Examiner admits that Riney '413 fails to teach or suggest a check valve. During the personal interview conducted May 23, 2007, the Examiner agreed that Akers '207 fails to teach or suggest a check valve that prevents backflow of liquid from a recirculation passageway through a recirculation outlet in a dispensing module. Rather, pressure relief valve 9 of Akers '207 is disposed in manifold block 125 and does not prevent backflow of liquid from a recirculation passageway through a recirculation outlet in a dispensing module. Moreover, variable restrictor 28 in the return hose or line 26a from dispenser 26 is not a check valve and does not prevent backflow of liquid, as set forth in the claims. Rather, the variable restrictor 28 restricts, but does not prevent, backflow of liquid from a recirculation passageway to the dispensing module, as set forth in the claims.

Claim 20 depends from independent claim 19, and claim 23 depends from independent claim 22. Accordingly, claims 20 and 23 are in condition for allowance for at least the reasons discussed above with respect to independent claims 19 and 22. Applicants therefore respectfully request that the rejections of claims 20 and 23 over Riney '413 in view of Akers '207 be withdrawn.

Claims 17, 25, 28, 29, and 31 are each directed to apparatus for applying liquid to a substrate. Claims 17 and 25 each recite check valves positioned in recirculation outlets. The recirculation outlets are part of the dispensing modules. During the personal interview conducted May 23, 2007, the Examiner admitted that neither Riney

'413 nor Akers '207 teaches or suggests a check valve in a dispensing module. For at least these reasons, Applicants respectfully request that the rejections of claims 17 and 25 over Riney '413 in view of Akers '207 be withdrawn.

Claim 26 depends from independent claim 25 and is therefore in condition for allowance for at least the reasons discussed above with respect independent claim 25. Accordingly, Applicants respectfully request that the rejection of claim 26 over Riney '413 in view of Akers '207 be withdrawn.

Independent claims 28, 29, and 31 are directed to apparatus for applying liquid to a substrate, and recite check valves positioned in recirculation passageways of an adapter plate. Neither Riney '413 nor Akers '207 teaches or suggests a check valve in a recirculation passageway of an adaptor plate, as set forth in these claims. Accordingly, Applicants respectfully request that the rejections of claims 28, 29, and 31 over Riney '413 in view of Akers '207 be withdrawn.

Claim 30 depends from independent claim 29 and claim 32 depends from independent claim 31. Accordingly, claims 30 and 32 are each in condition for allowance for at least the reasons discussed above with respect to independent claims 29 and 31, and Applicants respectfully request that the rejections of these claims over Riney '413 in view of Akers '207 be withdrawn.

Independent claim 37 is directed to an apparatus for applying liquid to a substrate and recites:

a dispensing module including an inlet coupled in fluid communication with said distribution passageway and a recirculation outlet coupled in fluid communication with said recirculation passageway, said recirculation outlet and said

recirculation passageway defining at least a portion of a recirculation path extending to said supply channel; and

a check valve positioned in said recirculation path and configured to prevent backflow of the liquid within said recirculation path (emphasis added).

Applicants respectfully request that the rejection of claim 37 be withdrawn because Riney '413 wholly fails to teach or suggest a check valve, and because Akers '207 fails to teach or suggest a check valve in a recirculation path that includes a recirculation outlet in a dispensing module, as discussed above.

Claims 21, 24, 27, and 33-35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Riney '413 and Akers '207, in further view of U.S. Patent No. 5,523,682 to Leon. Claim 36 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Riney '413, Akers '207, and Leon '682, in further view of U.S. Patent No. 4,543,649 to Head et al. Claim 33 is the only independent claim of this rejected group and is directed to a method of applying liquid to a substrate, including:

returning the liquid from the dispensing module to a recirculation path in the manifold while the dispensing module is in the recirculating condition; and

sending a signal to a control coupled with the dispensing module indicating that the dispensing module is in the recirculating condition.

As noted in the Amendments filed January 30, 2007, and June 25, 2007, the rejection is not clear as to which references were relied upon to obtain each step recited in claim 33. Nevertheless, Applicants respectfully traverse the rejection of claim 33

because neither Riney '413 nor Akers '207 teaches or suggests "sending a signal to a control coupled with the dispensing module indicating that the dispensing module is in the recirculating condition." Leon '682 is directed to a system that determines the position of an electrically conductive element movably positioned in a housing, but does not teach or suggest sending a signal to a control coupled to a dispensing module to indicate that the dispensing module is in a recirculating condition, as set forth in claim 33. For at least these reasons, Applicants respectfully request that the rejection of claim 33 over the combination of Riney '413, Akers '207, and Leon '682 be withdrawn.

Claims 34-36 each depend from independent claim 33 and are therefore in condition for allowance for at least the reasons discussed above, and because the further combination of Riney '413, Akers '207, and Leon '682 with Head '649 fails to cure these deficiencies.

Claim 21 depends from independent claim 19, claim 24 depends from independent claim 22, and claim 27 depends from independent claim 25. Accordingly, Applicants assert that claims 21, 24, and 27 are each in condition for allowance for at least the reasons discussed above with respect to independent claims 19, 22, and 25, and because the further combination of Riney '413 and Akers '207 with Leon '682 fails to cure the deficiencies of Riney '413 and Akers '207 discussed above.

Conclusion

In view of the foregoing amendments to the claims and the remarks set forth herein, Applicants believe this case is in condition for allowance and respectfully request allowance of the pending claims.

Applicants request a personal interview with the Examiner prior to the next action to resolve any remaining issues.

Applicants do not believe that any fee is due in connection with this submission. However, if any fees are necessary to complete this communication, the Commissioner may consider this to be a request for such and charge any necessary fees to Deposit Account No. 23-3000.

Respectfully submitted,

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